

Andrew J. Lail

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EDUCATION

University of Wisconsin-Madison, Madison, WI, USA

Master of Science in Pharmaceutical Sciences (under Dr. Jason Kwan)

August 2020-April 2023

Georgia Institute of Technology, Atlanta, GA, USA

Bachelor of Science in Biochemistry, Minor in Biology (Research Option)

Graduated May 2019

Study Abroad at Victoria University of Wellington, New Zealand

Jul-Nov 2016

RESEARCH EXPERIENCE

AIDS Vaccine Research Laboratory, University of Wisconsin-Madison

February 2024-Present

Research Specialist - Principle Investigator: Dr. David O'Connor

Completed library preparation and sequencing for SARS-CoV-2 genomic surveillance projects

Drove assay development and analysis for air metagenomics initiative

Mentored undergraduate researchers towards group objectives and their development as scientists

Led the lab's outbreak response to dairy cattle influenza

School of Pharmacy, University of Wisconsin-Madison

August 2020-April 2023

Graduate student – Mentor: Dr. Jason Kwan

Investigated natural product producing microbial symbionts using bioinformatic tools

Optimized a novel RNA extraction protocol for an environmental microbe

Wrote and defended a research thesis

Institute of Agriculture, University of Tennessee

May 2019-June 2020

Research Technician III - Principal Investigator: Dr. Neal Stewart

Automated manual protocols using a high throughput liquid handling robot

Assembled genetic constructs for chloroplast engineering

School of Chemistry and Biochemistry, Georgia Institute of Technology

August 2017-May 2019

Undergraduate Researcher - Mentor: Dr. Vinayak Agarwal

Investigated specificity of carrier proteins and halogenases in halogenated pyrrole natural product biosynthesis

PUBLICATIONS

Lail, A. J.; Vuyk, W. C.; Machkovech, H.; Minor, N. R.; Hassan, N. R.; Dalvie, R.; Emmen, I. E.; Wolf, S.; Kalweit, A.; Wilson, N.; Newman, C. M.; Tiburcio, P. B.; Weiler, A.; Friedrich, T. C.; O'Connor, D. H. Amplicon Sequencing of Pasteurized Retail Dairy Enables Genomic Surveillance of H5N1 Avian Influenza Virus in United States Cattle. *PLOS ONE* **2025**, 20 (6), e0325203. <https://doi.org/10.1371/journal.pone.0325203>.

Vuyk, W.; Bobholz, M.; Emmen, I.; **Lail, A.**; Minor, N.; Bhimalli, P.; Eickhoff, J. C.; Ries, H. J.; Machkovech, H.; Wei, W.; Weiler, A.; Richardson, A.; DePachter, C.; VanSleet, G.; Bhasin, M.; Kamal, S.; Wolf, S.; Viridi, A.; Bradley, T.; Gifford, A.; Benito, M.; Shipe, A.; Mohamed, R.; Smith, J.; Wilson, N.; Friedrich, T. C.; O'Connor, D. H.; Garonzik-Wang, J. Longitudinal Assessment of Solid Organ Transplant Recipients With SARS-CoV-2 Infection. *Transplantation Proceedings* **2025**, 57 (5), 922–930. <https://doi.org/10.1016/j.transproceed.2025.04.004>.

Emmen, I. E.; Vuyk, W. C.; **Lail, A. J.**; Wolf, S.; O'Connor, E. J.; Dalvie, R.; Bhasin, M.; Viridi, A.; White, C.; Hassan, N. R.; Richardson, A.; VanSleet, G.; Weiler, A.; Rounds-Dunn, S.; Horn, K. V.; Gartler, M.; Jorgenson, J.; Spelman, M.; Ottosen, S.; Minor, N. R.; Wilson, N.; Friedrich, T. C.; O'Connor, D. H. SARS-CoV-2 Genomic Surveillance from Community-Distributed Rapid Antigen Tests, Wisconsin, USA - Volume 31, Supplement—April 2025 - Emerging Infectious Diseases Journal - CDC. **2025**. <https://doi.org/10.3201/eid3113.241192>.

Rees, E. R.; Uppal, S.; Clark, C. M.; **Lail, A. J.**; Waterworth, S. C.; Roesemann, S. D.; Wolf, K. A.; Kwan, J. C. Autometa 2: A Versatile Tool for Recovering Genomes from Highly-Complex Metagenomic Communities. *bioRxiv* September 5, 2023, p 2023.09.01.555939. <https://doi.org/10.1101/2023.09.01.555939>.

Occhialini, A.; Pfothenhauer, A. C.; Li, L.; Harbison, S. A.; **Lail, A. J.**; Burris, J. N.; Piasecki, C.; Piatek, A. A.; Daniell, H.; Stewart Jr, C. N.; Lenaghan, S. C. Mini-Synplastomes for Plastid Genetic Engineering. *Plant Biotechnology Journal* **2022**, 20 (2), 360–373. <https://doi.org/10.1111/pbi.13717>.

Occhialini, A.; Pfothenhauer, A. C.; Frazier, T. P.; Li, L.; Harbison, S. A.; **Lail, A. J.**; Mebane, Z.; Piatek, A. A.; Rigoulot, S. B.; Daniell, H.; Stewart, C. N.; Lenaghan, S. C. Generation, Analysis, and Transformation of Macro-Chloroplast Potato (*Solanum Tuberosum*) Lines for Chloroplast Biotechnology. *Scientific Reports* **2020**, 10 (1), 21144. <https://doi.org/10.1038/s41598-020-78237-x>.

Thapa, H. R.; **Lail, A. J.**; Garg, N.; Agarwal, V. Chemoenzymatic Synthesis of Starting Materials and Characterization of Halogenases Requiring Acyl Carrier Protein-Tethered Substrates. *Methods Enzymol* **2018**, 604, 333–366. <https://doi.org/10.1016/bs.mie.2018.01.028>.

PRESENTATIONS

Andrew J. Lail et al. “Longitudinal sequencing of long SARS-CoV-2 infection reveals viral change over time.” 13th Annual Wisc-e-sota Virology Symposium. 26 September 2025. Poster.

Andrew J. Lail. “Pasteurized retail dairy enables genomic surveillance of H5N1 avian influenza virus in United States cattle.” International Plant and Animal Genome Conference. 14 January 2025. **Talk.**

Andrew J. Lail et al. “Sequencing pasteurized retail dairy RNA enables genomic surveillance on H5N1 avian influenza outbreak in cattle.” 12th Annual Wisc-e-sota Virology Symposium. 27 September 2024. Poster.

Andrew J. Lail. “Retail dairy sampling for HPAI H5N1.” CDC SPHERES Meeting. 18 July 2024. **Talk.**

Andrew J. Lail. “Halogenase and carrier protein specificity in biosynthesis of halogenated pyrroles.” Georgia Tech Undergraduate Research Symposium. 9 April 2019. **Talk.**

Andrew J. Lail. “Crystallization of an Enzyme Involved in Polybrominated Aromatic Compounds” Georgia Tech Undergraduate Research Symposium. 17 April 2018. Poster.

AWARDS AND HONORS

Wisconsin Distinguished Graduate Fellowship	2020-21
Pharmaceutical Sciences Graduate Scholar	2020
President’s Undergraduate Research Award	Fall 2018
Zell Miller Scholarship	2015-2019

TECHNICAL SKILLS

Wet Lab	Plant genotyping	Nextflow
Oxford Nanopore sequencing	Southern Blot	Geneious
Illumina sequencing	LC-MS	Microsoft Office (Word and Excel)
DNA/RNA Extraction	MALDI-TOF MS	Adobe Indesign
DNA/RNA Sequencing	Protein Mass Spec	Adobe Illustrator
Chromatography	Fluorescence microscopy	ChemDraw
SDS-PAGE	Computational	Cluster computing
Bacterial Transformation	Bash	Phylogenetic trees
PCR	Python	Variant analysis
DNA Gel Electrophoresis	Pandas	BV-BRC tools
Mini/MidiPrep	Conda	